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**Agrément Certificate**

**91/2691**

Product Sheet 2

**WEBER EXTERNAL WALL INSULATION SYSTEMS**

**WEBERTHERM XM EXTERNAL WALL INSULATION SYSTEM**

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Webertherm XM External Wall Insulation System, comprising grey expanded polystyrene (EPS) or phenolic (PHS) insulation boards, adhesively fixed, with supplementary mechanical fixings, and reinforced basecoat, primer and render finishes. The system is suitable for use, with height restrictions, on the outside of external masonry walls in new and existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

**CERTIFICATION INCLUDES:**

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.



**KEY FACTORS ASSESSED**

**Thermal performance** — the system can be used to improve the thermal performance of external masonry walls and can contribute to satisfying the requirements of the national Building Regulations (see section 6).

**Strength and stability** — the system can adequately resist wind loads and have sufficient resistance to impact damage (see section 7).

**Behaviour in relation to fire** — the system can have a B-s1, d0 or B-s2, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2018, depending on the system configuration, and its use is restricted (see section 8).

**Risk of condensation** — the system can contribute to limiting the risk of interstitial and surface condensation (see section 11).

**Durability** — when installed and maintained in accordance with the Certificate holder's recommendations and the terms of this Certificate, the system will remain effective for at least 30 years (see section 13).



The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agreement

Date of Second issue: 3 December 2020

Originally certificated on 25 November 1991

Hardy Giesler  
Chief Executive Officer

*The BBA is a UKAS accredited certification body – Number 113.*

*The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)*

*Readers MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*

*Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.*

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## Regulations

In the opinion of the BBA, the Webertherm XM External Wall Insulation System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



### The Building Regulations 2010 (England and Wales) (as amended)

<b>Requirement:</b>	<b>A1</b>	<b>Loading</b>
Comment:	The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.	
<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
Comment:	The system is restricted by this Requirement. See sections 8.1 to 8.4 of this Certificate.	
<b>Requirement:</b>	<b>C2(b)</b>	<b>Resistance to moisture</b>
Comment:	The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.	
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
Comment:	The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.2 and 11.4 of this Certificate.	
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
Comment:	The system can contribute to satisfying this Requirement. See sections 6.1 and 6.2 of this Certificate.	
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
Comment:	The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.	
<b>Regulation:</b>	<b>7(2)</b>	<b>Materials and workmanship</b>
Comment:	The system is restricted by this Regulation. See sections 8.1 to 8.4 of this Certificate.	
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rate for new buildings</b>
<b>Regulation:</b>	<b>26A</b>	<b>Primary energy consumption rates for buildings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26B</b>	<b>Fabric performance values for new dwellings (applicable to Wales only)</b>
<b>Regulation:</b>	<b>26A</b>	<b>Fabric energy efficiency rates for new dwellings (applicable to England only)</b>
Comment:	The system can contribute to satisfying these Regulations; however, compensating fabric/services measures may be required. See sections 6.1 and 6.2 of this Certificate.	



### The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)(2)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:	The system can contribute to a construction satisfying this Regulation. See sections 12 and 13.1 and the <i>Installation</i> part of this Certificate.	
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	<b>1.1</b>	<b>Structure</b>
Comment:	The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.	
Standard:	<b>2.6</b>	<b>Spread to neighbouring buildings</b>
Comment:	The system is restricted by this Standard, with reference to clauses 2.6.4 <sup>(1)(2)</sup> , 2.6.5 <sup>(1)</sup> and 2.6.6 <sup>(2)</sup> . See sections 8.1 to 8.3, 8.5 and 8.6 of this Certificate.	

Standard: Comment:	2.7	Spread on external walls The system is restricted by this Standard, and is acceptable for use more than one metre from a boundary, with reference to clause 2.7.1 <sup>(1)(2)</sup> . See sections 8.1 to 8.3, 8.5 and 8.6 of this Certificate.
Standard: Comment:	3.10	Precipitation The system can contribute to a construction satisfying this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> and 3.10.2 <sup>(1)(2)</sup> . See section 10.1 of this Certificate.
Standard: Comment:	3.15	Condensation The system can contribute to satisfying the requirements of this Standard, with reference to clauses 3.15.1 <sup>(1)(2)</sup> , 3.15.4 <sup>(1)(2)</sup> and 3.15.5 <sup>(1)(2)</sup> . See sections 11.3 and 11.4 of this Certificate.
Standard: Standard: Comment:	6.1(b) 6.2	Carbon dioxide emissions Buildings insulation envelope The system can contribute to satisfying these Standards, with reference to clauses, or parts of, 6.1.1 <sup>(1)</sup> , 6.1.2 <sup>(1)(2)</sup> , 6.1.3 <sup>(1)(2)</sup> , 6.1.6 <sup>(1)</sup> , 6.1.10 <sup>(2)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(2)</sup> , 6.2.5 <sup>(2)</sup> , 6.2.6 <sup>(1)</sup> , 6.2.7 <sup>(1)</sup> , 6.2.8 <sup>(2)</sup> , 6.2.9 <sup>(1)(2)</sup> , 6.2.10 <sup>(1)</sup> , 6.2.11 <sup>(1)</sup> , 6.2.12 <sup>(2)</sup> and 6.2.13 <sup>(1)(2)</sup> . See sections 6.2 and 6.3 of this Certificate.
Standard: Comment:	7.1(a)(b)	Statement of sustainability The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting the bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ], 7.1.6 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ] and 7.1.7 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> ]. See section 6.1 of this Certificate.
Regulation: Comment:	12	<b>Building standards applicable to conversions</b> Comments in relation to the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> .
(1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).		



## The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation: Comment:	23	<b>Fitness of materials and workmanship</b> The system is acceptable. See section 13.1 and the <i>Installation</i> part of this Certificate.
Regulation: Comment:	28(b)	<b>Resistance to moisture and weather</b> The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.
Regulation: Comment:	29	<b>Condensation</b> The system can contribute to minimising the risk of interstitial condensation. See sections 11.4 of this Certificate.
Regulation: Comment:	30	<b>Stability</b> The system can sustain and transmit wind loads to the substrate wall. See sections 7.1 to 7.12 of this Certificate.
Regulation: Comment:	36(a)	<b>External fire spread</b> The system is restricted by this Regulation. See sections 8.1 to 8.4 of this Certificate.

Regulation:	39(a)(i)	Conservation measures
Regulation:	40	Target carbon dioxide emission rate
Comment:	The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.	

## Construction (Design and Management) Regulations 2015

## Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1 and 3.3) and 12 *Maintenance and repair* of this Certificate.

### Additional Information

#### NHBC Standards 2020

In the opinion of the BBA, the Webertherm XM External Wall Insulation System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*<sup>(1)</sup>, Part 6 *Superstructure*, Chapter 6.9 *Curtain walling and cladding*.

(1) There is a general requirement in *NHBC Standards 2020*, Chapter 6.9, for fire-retardant-treated EPS insulation to be used with the system in accordance with BS EN 13163 : 2012.

### Technical Specification

#### 1 Description

1.1 The Webertherm XM External Wall Insulation System comprises EPS or PHS insulation boards, adhesively fixed direct to the external masonry wall with supplementary mechanical fixings<sup>(1)</sup> (a minimum of 50% coverage of adhesive with EPS and a minimum of 60% with phenolic), reinforced basecoat and finish (see Table 1A and 1B).

1.2 After the insulation boards have been secured to the wall with insulation adhesive and the required number of mechanical fixings, the basecoat is trowel-applied over the boards, followed by the reinforcing mesh, which is fully embedded within the basecoat by applying a second pass of basecoat 'wet on wet'. After the reinforced basecoat has cured, primer (if required) is applied followed by the finish. For the weberwall brick system the installation procedure is described in section 16 (see Tables 1A and 1B).

(1) A minimum of 5 supplementary fixings must be used with each EPS and phenolic insulation board.

*Table 1A Webertherm XM summary for the system utilising weberend LAC basecoat*

Components	Option 1	Option 2
Adhesive	weberend LAC	weberend LAC
Insulation	webertherm EPS webertherm PHS	webertherm EPS webertherm PHS
Basecoat	weberend LAC	weberend LAC
Reinforcement	weber mesh	weber mesh
Top coat	weberend PTC	-
Primer	weber PR310	weber PR310
Finishes	weber dry dash aggregate weberplast TF webersil TF webermineral TF	weberplast TF webersil TF webermineral TF

*Table 1B Webertherm XM summary for the system utilising weberwall brick external adhesive or weberend LAC Rapid basecoat*

Components	Option 1	Option 2 (weberwall brick)	Option 3
Adhesive	weberend LAC	weberend LAC	weberend LAC
Insulation	webertherm EPS	webertherm EPS	webertherm EPS
Basecoat	weberend LAC Rapid	weberwall brick external adhesive	weberend LAC Rapid
Reinforcement	weber mesh	weber mesh	weber mesh
Top coat	weberend PTC	—	—
Primer	weber PR310	—	—
Finishes	weber dry dash aggregate weberplast TF webersil TF webermineral TF	weberwall brick pointed with weberwall brick pointing mortar	weberplast TF webersil TF webermineral TF

1.3 The system comprises:

#### Adhesive

- weberend LAC — a polymer-modified cementitious basecoat mortar, supplied as a powder to which 5 litres of clean water is added. Applied at a coverage of  $3 \text{ kg}\cdot\text{m}^{-2}$

#### Insulation<sup>(1)</sup>

- webertherm EPS Grey — expanded polystyrene (EPS 70E) insulation boards, measuring 1200 by 600 mm, in a range of thicknesses from 30 to 200 mm, with a nominal density of  $15 \text{ kg}\cdot\text{m}^{-3}$ , a compressive strength of  $70 \text{ kN}\cdot\text{m}^{-2}$ , and a minimum tensile strength of 100 kPa. Boards are manufactured to comply with the requirements of BS EN 13163 : 2012 and classified as Euroclass E in accordance with BS EN 13501-1 : 2018
- webertherm PHS (phenolic) — insulation boards measuring 1200 by 600 mm in a range of thicknesses between 30 and 120 mm, with a nominal density of  $35 \text{ kg}\cdot\text{m}^{-3}$ , a minimum compressive strength of  $120 \text{ kN}\cdot\text{mm}^{-2}$  and a tensile strength to perpendicular to the faces of  $80 \text{ kN}\cdot\text{mm}^{-2}$ . The boards are manufactured to comply with the requirements of BS EN 13166 : 2012, and classified as Euroclass C-s2, d0 in accordance with BS EN 13501-1 : 2018

(1) For Declared thermal conductivity values ( $\lambda_D$ ) see Table 3 of this Certificate.

#### Mechanical fixings (supplementary)

- mechanical fixings — fixing anchors with various lengths to suit the substrate and insulation thickness, approved and supplied by the Certificate holder, and selected from:
  - Fischer Termoz CS 8 — polypropylene with stainless steel or electro-galvanized screw
  - EJOT NT U — polyethylene, HDPE anchor sleeve with a stainless steel or electro-galvanized centre pin.
  - EJOT STR U — polyethylene, HDPE anchor sleeve with a stainless steel or electro-galvanized centre screw.
  - EJOT STR U 2G — polyethylene, HDPE anchor sleeve with a stainless steel or electro-galvanized centre screw.
  - EJOT H1 eco — polyethylene, HDPE anchor sleeve with an electro-galvanized pin and a polyamide, PA GF 50 mounting plug

#### Basecoat

- weberend LAC — a polymer-modified cementitious basecoat mortar, supplied as a powder to which 5 litres of clean water is added. Applied in two passes at a coverage of  $6.5 \text{ kg}\cdot\text{m}^{-2}$  and an overall thickness of 6 mm
- weberend LAC Rapid — a polymer-modified cementitious basecoat mortar, supplied as a powder to which 5 litres of clean water is added. Applied in two passes at a coverage of  $6.5 \text{ kg}\cdot\text{m}^{-2}$  and an overall thickness of 6 mm

- weberwall brick external adhesive — a polymer-modified cementitious basecoat/adhesive mortar, supplied as a powder to which 5 litres of clean water is added. Applied in two passes at a coverage of  $6.5 \text{ kg}\cdot\text{m}^{-2}$  and an overall thickness of 6 mm

### **Reinforcement**

- weber mesh — a woven glass fibre reinforcing mesh (3.8 by 3.5 mm) with a polymer coating and a nominal weight of  $160 \text{ g}\cdot\text{m}^{-2}$

### **Top coats**

- weberend PTC — a factory-batched, polymer-modified cementitious mortar, supplied as a powder to which 5 litres of clean water is added. Applied at a coverage of  $10 \text{ kg}\cdot\text{m}^{-2}$  to give a thickness of 6 to 8 mm. Used as a dash receiver and a top coat

### **Primer**

- weber PR310 — a ready to use, white styrene-acrylic-resin-based emulsion containing fine filters and coalescing agent (see Tables 1A and 1B for compatibility with the system components). Applied at a coverage of  $0.25 \text{ l}\cdot\text{m}^{-2}$ .

### **Finishes**

#### ***Render finishes***

- weberplast TF — an acrylic-bonded, textured render supplied as a paste containing aggregates of 1.5 mm. Applied at a coverage of  $2.8 \text{ kg}\cdot\text{m}^{-2}$  to give a thickness of 1.5 mm. Available in a range of colours
- webersil TF — a silicone-bonded, textured render supplied as a paste containing aggregates of 1.5 mm. Applied at a coverage of  $2.7 \text{ kg}\cdot\text{m}^{-2}$  to give a thickness of 1.5 mm. Available in a range of colours
- webermineral TF — a polymer-modified mineral finishing coat containing aggregates of 1.5 mm, requiring the addition of 3.4 to 4.4 litres of clean water per 20 kg bag. Applied at a coverage of  $2.7 \text{ kg}\cdot\text{m}^{-2}$  to give a thickness of 1.5 mm. Available in a range of colours

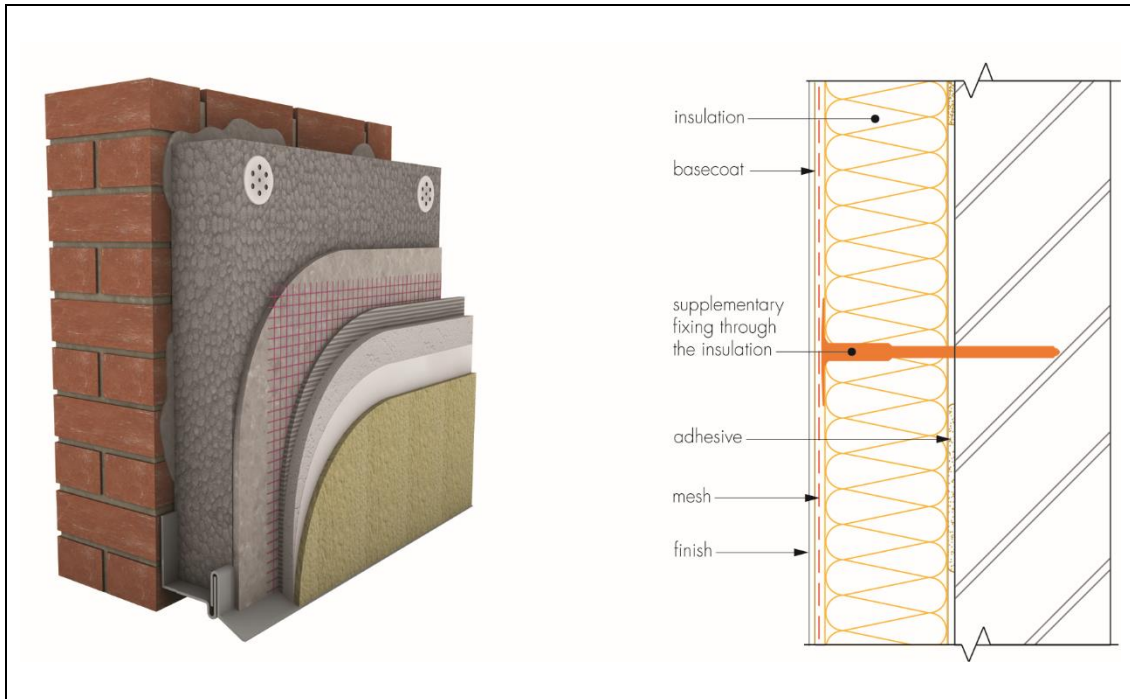
#### ***Brick slip finish and pointing mortar***

- weberwall brick — flexible mineral brick slips, typically supplied in standard size of dimensions 65 by 215 by 5 mm with a nominal weight of  $6 \text{ kg}\cdot\text{m}^{-2}$  and are supplied as a sheet comprising several brick slips prepressed on glass fibre mesh-reinforcement. Available as straight brick-slips and corner brick-slips and in a range of colours
- weberwall brick pointing mortar — a polymer-modified, dry powder, cement based mortar for use with weberwall brick

#### ***Dry-dash aggregate finish***

- weber Dry Dash Aggregate — sized up to 6 mm and available in a range of colours, applied direct to weberend PTC. Applied at a coverage of 10 to  $15 \text{ kg}\cdot\text{m}^{-2}$

**Figure 1 The Webertherm XM External Wall Insulation System**



1.4 Ancillary materials also used with the system, but outside the scope of this Certificate, are:

- a range of aluminium, PVC-U or stainless steel profiles, comprising:
  - base profile
  - edge profile
  - corner profile with optional PVC-U nosing
  - render stop profile
  - movement joint
  - expansion joint
- profile connectors and fixings.
- fungicidal wash
- silicone sealant in accordance with BS EN ISO 11600 : 2003
- expansion foam — polyurethane foam used for filling gaps between insulation boards
- fire barriers.

## 2 Manufacture

2.1 The system components are manufactured by the Certificate holder or bought in from suppliers, to an agreed specification.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Saint-Gobain Construction Products UK Limited t/a Saint-Gobain Weber has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI (Certificates FM 641234 and FM 01209).



### 3 Delivery and site handling

3.1 The system components are delivered to site in the packaging and quantities listed in Table 2. Each package carries the product identification and batch number.

*Table 2 Component supply details*

Component	Quantity and packaging
Insulation	Shrink-wrapped in polyethylene (on pallets)
weberend LAC adhesive and basecoat	20 kg bags
weberend LAC Rapid basecoat	20 kg bags
weberwall brick external adhesive	20 kg bags
weber mesh	1 m wide by 50 m lengths
weberend PTC	25 kg bags
weber PR310	10 litre containers
weber dry-dash aggregate	25 kg bags
weberplast TF	15 kg plastic pails
webersil TF	15 kg plastic pails
webermineral TF	20 kg bags
weberwall brick slips	boxed by manufacturer
weberwall brick pointing mortar	25 kg bags
mechanical fixings	boxed by manufacturer, 100 per box

3.2 The insulation must be stored on a firm, clean, level base, off the ground and under cover until required for use. Care must be taken when handling to avoid damage.

3.3 The insulation must be protected from prolonged exposure to sunlight, either by storing opened packs under cover or re-covering with opaque polythene sheeting. Care must be taken to avoid contact with solvents or materials containing volatile organic components. The boards must not be exposed to open flame or other ignition sources. Boards that become damaged, soiled or wet should be discarded.

3.4 The powder and paste components must be stored in dry conditions between 5 and 30°C, off the ground and protected from moisture. Contaminated materials should be discarded.

3.5 The primer and finishes should be stored in a safe area, under cover, and protected from excessive heat and frost at all times.

3.6 Bagged aggregate should be stored in a dry location.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Webertherm XM External Wall Insulation System.

## Design Considerations

### 4 General

4.1 The Webertherm XM External Wall Insulation System, when installed in accordance with this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external masonry or concrete walls of new and existing buildings. It is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from treatment with the system (eg the insulation must be protected by an overhang, and window sills should be designed and installed so as to direct water away from the building).



4.2 For improved thermal/carbon-emissions performance of the structure, the designer should consider additional/alternative fabric and/or services measures.

4.3 The system is for application to the outside of external walls of masonry, normal weight concrete, lightweight concrete, autoclaved concrete and no-fines concrete construction, on new or existing domestic and non-domestic buildings (with or without existing render) with height restrictions (see section 8). Prior to the installation of the system, wall surfaces should comply with section 14.

4.4 New walls subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1992-1-1 : 2004 and its UK National Annex
- BS EN 1996-1-1 : 2005 and its UK National Annex
- BS EN 1996-2 : 2006 and its UK National Annex
- BS 8000-0 : 2014
- BS 8000-2.2 : 1990
- BS 8000-3 : 2001.

4.5 New walls not subject to regulatory requirements should also be built in accordance with the Standards identified in section 4.4.

4.6 Movement joints should be incorporated into the system in line with existing movement joints in the building structure and in accordance with the Certificate holder's recommendations for the specific installation.

4.7 The system will improve the weather resistance of a wall and provide a decorative finish. However, for existing buildings, it should only be installed where there are no signs of dampness on the inner surface of the wall other than those caused solely by condensation.

4.8 The effect of the system on the acoustic performance of a construction is outside the scope of this Certificate.

4.9 The fixing of sanitary pipework, plumbing, rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items to the system is outside the scope of this Certificate (see section 4.10).

4.10 External pipework and ducts should be removed before installation, and alterations made to underground drainage to accommodate repositioning of the pipework to the finished face of the system. The Certificate holder can advise on suitable fixing methods, but these are outside the scope of this Certificate.

4.11 The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

4.12 It is essential that the system is installed and maintained in accordance with the conditions set out in this Certificate.

## 5 Practicability of installation

The system should only be installed by specialist contractors who have successfully undergone training and registration by the Certificate holder (see section 15).

**Note:** The BBA operates a UKAS-accredited Approved Installer Scheme for external wall insulation (non-mandatory); details of approved installer companies are included on the BBA's website ([www.bbacerts.co.uk](http://www.bbacerts.co.uk)).

## 6 Thermal performance



6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2006, using the declared thermal conductivity ( $\lambda_D$ ) values of the insulations given in Table 3 of this Certificate.

**Table 3 Declared thermal conductivity ( $\lambda_D$ ) values and available thicknesses**

Insulation types	Insulation board thickness range (mm)	Thermal conductivity ( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ )
webertherm EPS 70 grey (032)	30 to 200	0.032
webertherm PHS	30 to 40	0.021
	50 to 120	0.020



6.2 The U value of a completed wall will depend on the selected insulation type and thickness, the fixing method and type and number of fixings, and the insulating value of the substrate masonry and its internal finish. Calculated U values for sample constructions in accordance with the national Building Regulations are given in Table 4, and are based on the thermal conductivity values given in Table 3.

**Table 4 Insulation thickness required to achieve design U values<sup>(1)(2)(3)</sup>**

U value <sup>(4)</sup> ( $\text{W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ )	Thickness of Insulation (mm)			
	215 mm brickwork, $\lambda = 0.56 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$		200 mm dense blockwork, $\lambda = 1.75 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$	
	webertherm EPS 032	webertherm PHS	webertherm EPS 032	webertherm PHS
0.18	170	110	180	120
0.19	160	100	170	110
0.25	120	80	130	80
0.26	110	70	120	80
0.28	100	70	110	70
0.30	100	60	100	70
0.35	80	50	90	60

- (1) Wall construction inclusive of 13 mm plaster ( $\lambda = 0.57 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ), brickwork (protected) with 17.1% mortar or dense blockwork with 6.7% mortar ( $\lambda = 0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) and an external render thickness of 5 mm ( $\lambda = 1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ). A 5 mm thick adhesive layer ( $\lambda = 1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ) covering 60% of the area is also included, together with a board emissivity of 0.9 and an external render thickness of 7.5 mm ( $\lambda = 1 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ).
- (2) Calculations based on a mechanical system that included 7 stainless steel fixings per square metre with a point thermal transmittance ( $X_p$ ) of  $0.002 \text{ W}\cdot\text{K}^{-1}$  per pin. Use of other types of fixings should be calculated in accordance with BS EN ISO 6946 : 2017.
- (3) Based upon incremental insulation thickness of 10 mm.
- (4) When applying the maximum available insulation thickness, these walls can achieve U values from 0.16 to  $0.19 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  depending on the insulation and wall type.

6.3 Care must be taken in the overall design and construction of junctions with other elements and openings to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

## 7 Strength and stability

### General



7.1 The Certificate holder is ultimately responsible for the design of the system and it is the responsibility of the company installing the system to accurately follow the installation instructions (see also section 5). The Certificate holder must also verify that a suitably experienced and qualified individual (with adequate professional indemnity) establishes that:

- the wind loads on the different zones of the building's elevation for the specific geographical location have been calculated correctly (see section 7.3)
- the system can adequately resist and safely transfer the calculated loads, accounting for all possible failure modes, to the substrate wall and supporting structure (see sections 7.3 to 7.6).

7.2 The substrate and supporting structure must be capable of transferring all additional loading due to the installation of the system to the ground in a satisfactory manner. The adequacy of the substrate and supporting structure must be verified by the person or party responsible for the global stability of the building to which the system is applied. Any defects should be made good prior to the system being installed.

7.3 The wind loads on the walls should be calculated, taking into account all relevant factors such as location and topography, in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. All of the factors affecting wind load on each elevation and specific zone of the building must be considered. In accordance with BS EN 1990 : 2002, a partial factor of 1.5 must be applied to the calculated characteristic wind load to establish the design wind load to be resisted by the system.

7.4 Installations correctly designed in accordance with this Certificate will safely accommodate the applied loads due to the self-weight of the system, wind and impact.

7.5 Positive wind load is transferred to the substrate wall directly via compression through the render and insulation system.

7.6 Negative wind load is transferred to the substrate wall via<sup>(1)(2)</sup>:

- the bond between the insulation and render system (see section 7.7)
- the tensile strength of the insulation (see section 7.8)
- the bond between the adhesive and the insulation interface<sup>(3)</sup> (see section 7.9)
- the bond between the substrate and adhesive interface<sup>(3)</sup> (see section 7.10).

(1) For adhesively fixed systems with supplementary mechanical fixings, the contribution of the fixings is not considered when calculating resistance to wind load.

(2) Further guidance is given in BBA Guidance Note 1, available on the BBA website ([www.bbacerts.co.uk](http://www.bbacerts.co.uk)).

(3) The percentage of adhesive coverage should be considered.

7.7 The characteristic bond resistance between the insulation and render interface derived from test results was  $70 \text{ kN}\cdot\text{m}^{-2}$  for EPS and  $29 \text{ kN}\cdot\text{m}^{-2}$  for PHS insulations. The design resistance of the bond between the insulation and render ( $N_{RD1}$ ) should be taken as the characteristic bond resistance divided by a partial factor of 9.

7.8 The characteristic tensile resistance of the insulation material may be taken as  $100 \text{ kN}\cdot\text{m}^{-2}$  for EPS and  $29 \text{ kN}\cdot\text{m}^{-2}$  for PHS insulations and should be divided by a partial material factor of 2.5 to establish the ultimate design resistance of the insulation ( $R_{d,ins}$ ).

7.9 The characteristic bond resistance between the adhesive and the insulation derived from test results was  $70 \text{ kN}\cdot\text{m}^{-2}$  for EPS and  $29 \text{ kN}\cdot\text{m}^{-2}$  for PHS insulations. The design resistance of the bond between the adhesive and insulation ( $N_{RD2}$ ) should be taken as this value divided by a partial factor of 9.

(1) The minimum bonded surface area ( $A_{min}$ ) should not be less than 50% with EPS and 60% with phenolic.

7.10 The characteristic bond resistance between the substrate and the adhesive derived from test results was  $250 \text{ kN}\cdot\text{m}^{-2(1)(2)(3)}$ . The design resistance of the bond between the substrate and the adhesive ( $N_{RD3}$ ) should be taken as the characteristic resistance divided by a partial factor of 9.

(1) The bond between the substrate and the adhesive from the test should have a minimum failure resistance of  $250 \text{ kN}\cdot\text{m}^{-2}$  after the adhesive has fully cured and in dry conditions, in accordance with ETAG 004 : 2013. The minimum failure resistance value is based on a minimum 28 day curing time of the test sample.

(2) The results from tests carried out on site for the bond (while the adhesive is curing) between the substrate and the adhesive should be at least equal to  $80 \text{ kN}\cdot\text{m}^{-2}$ .

(3) The minimum bonded surface area ( $A_{min}$ ) should not be less than 50% with EPS and 60% with phenolic.

7.11 The number and spacing of the supplementary fixings should be determined by the Certificate holder. Provided the substrate wall is suitable and the supplementary fixings are covered by an appropriate ETA, the fixings will initially transfer the weight of the insulation system to the substrate wall while the adhesive is curing. However, since the characteristic pull-out resistance values are dependent on the substrate type, the fixing must be selected to suit the specific loads and substrate<sup>(1)</sup>.

(1) To qualify as suitable data, the age and condition of the substrate must be equivalent to that used to establish the values in the ETA. If this not the case, site-specific pull out tests must be carried out.

7.12 The data obtained from sections 7.6 to 7.10 must be assessed against the design wind load and the following expression must be satisfied:<sup>(1)(2)</sup>

For safe design:

$$R_d \geq W_e$$

$$R_{d,b,ins/render} = A_r * N_{RD1}$$

$R_{d,t,ins}$  = characteristic tensile strength of insulation/2.5

$$R_{d,b,adh/ins} = A_{min} * N_{RD2}$$

$$R_{d,b,sub/adh} = A_{min} * N_{RD3}$$

Where:

$R_d$  is the design ultimate resistance ( $kN \cdot m^{-2}$ ) taken as the minimum of  $R_{d,b,ins/render}$ ,  $R_{d,t,ins}$ ,  $R_{d,b,adh/ins}$  and  $R_{d,b,sub/adh}$

$W_e$  is the maximum design wind load ( $kN \cdot m^{-2}$ )

$R_{d,b,ins/render}$  is the bond design resistance between the insulation and render ( $kN \cdot m^{-2}$ )

$A_r$  is the reinforced basecoat bond area (based on % area covered)

$N_{RD1}$  is the design adhesive bond resistance between the insulation and render based on tests ( $kN \cdot m^{-2}$ )

$R_{d,b,adh/ins}$  is the bond design resistance between the insulation and adhesive ( $kN \cdot m^{-2}$ )

$A_{min}$  is the minimum bonded surface area (based on % area covered)

$N_{RD2}$  is the design bond resistance between insulation and adhesive based on tests ( $kN \cdot m^{-2}$ )

$R_{d,b,sub/adh}$  is the design bond resistance between the substrate and adhesive ( $kN \cdot m^{-2}$ )

$N_{RD3}$  is the design bond resistance between the substrate and adhesive based on tests ( $kN \cdot m^{-2}$ )

- (1) If the minimum design resistance ( $R_d$ ) calculated in sections 7.6 to 7.9 is less than the design wind pressure, the bonded surface area ( $A_{min}$ ) should be increased.
- (2) If the minimum bonded surface area required to resist the design wind load is higher than 100%, the system would need to be mechanically fixed and therefore should not be installed: mechanically fixed system requirements have not been assessed with this Certificate.

## Impact resistance

7.13 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in the Use Categories up and including those specified in Table 5 of this Certificate.

**Table 5 System impact resistance**

Render systems: basecoat + finishing coats indicated below:	Use Category <sup>(1)</sup>
weberend LAC + weberend PTC + weber Dry Dash Aggregate	II
weberend LAC + weber PR310 + webersil TF	
weberend LAC + weber PR310 + weberplast TF	
weberend LAC + weber PR310 + webermineral TF	
weberend LAC + weberend PTC + weber PR310 + weberplast TF	
weberend LAC + weberend PTC + weber PR310 + webersil TF	
weberend LAC + weberend PTC + weber PR310 + webermineral TF	
weberend LAC Rapid + weberend PTC + weber Dry Dash aggregate	
weberend LAC Rapid + webersil TF	
weberend LAC Rapid + weberplast TF	
weberend LAC Rapid + webermineral TF	
weberend LAC Rapid + weberend PTC + weber PR310 + weberplast TF	
weberend LAC Rapid + weberend PTC + weber PR310 + webersil TF	
weberend LAC Rapid + weberend PTC + weber PR310 + webermineral TF	
weberwall brick external adhesive + weberwall brick + weberwall brick pointing mortar	

(1) The Use Categories are defined in ETAG 004 : 2013 as:

- Category I — a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
- Category II — a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care
- Category III — a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

## 8 Behaviour in relation to fire



8.1 The reaction to fire classifications<sup>(1)</sup> of the system in accordance with BS EN 13501-1: 2018 are given in Table 6 of this Certificate.

(1) Warringtonfire Testing and Certification Ltd. Report numbers 420280, 420281, 420283, 420284, 423691, 428354, 428393, 423688, 423692, 423702, 428043, 428045, 428355, 428406, 428410 and 428419

*Table 6 System fire classifications*

Rendering system comprising:	Render colour	Classification
webermineral TF webersil TF weberplast TF	Any	B-s2, d0
weberend PTC + webermineral TF weberend PTC + webersil TF weberend PTC + weberplast TF weberwall brick weberend PTC (Dry dash finish)	Any	B-s1, d0



8.2 The classification applies to the full range of thicknesses, finishes and colour combinations covered by this Certificate.

8.3 The insulation materials in isolation are not classified as 'non-combustible' or 'of limited combustibility'.



8.4 In England, Wales and Northern Ireland, the system is not classified as 'non-combustible' or 'of limited combustibility' and may be used on buildings at any proximity to a boundary. The system is restricted for use up to 18 m in height.



8.5 In Scotland, the system is not classified as 'non-combustible' and may be used on buildings more than 1 m from a boundary and, on houses, at any distance from a boundary. With minor exceptions, the system should be included in calculations of unprotected area, except on houses where the external wall behind has the appropriate fire resistance.

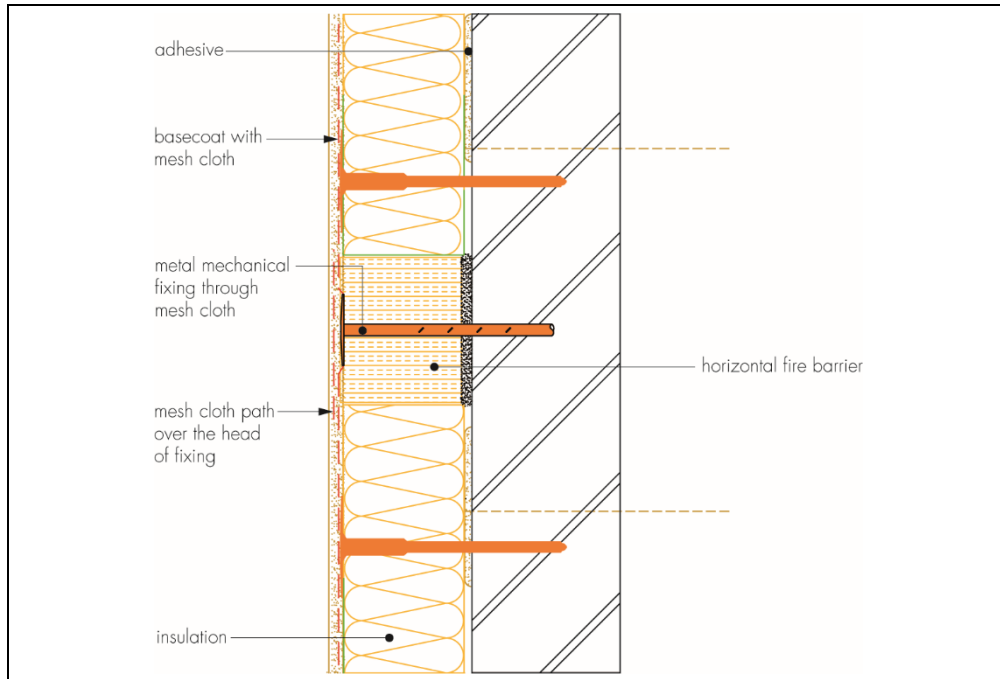
8.6 In Scotland, the system should not be used on any building with a storey more than 11 m above the ground, or on any entertainment or assembly building with a total storey area more than 500 m<sup>2</sup>, or on any hospital or residential care building with a total storey area more than 200 m<sup>2</sup>.

8.7 For application to second storey walls and above, it is recommended that the designer includes at least one stainless steel fixing per square metre, as advised in BRE Report BR 135 : 2013.

8.8 NHBC Standards require in all cases that a minimum of one non-combustible fixing through the reinforcement mesh, per square metre or per insulation board, whichever provides the greater number, should be provided, in addition to the other fixings.

8.9 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity barriers, service penetrations and combustibility limitations for other materials and components used in the overall wall construction.

Figure 2 Fire barrier details



## 9 Proximity of flues and appliances

Where the system is installed in close proximity to certain flue pipes, the relevant provisions of the national Building Regulations should be satisfied.

## 10 Water resistance



10.1 The system will provide a degree of protection against water ingress. However, care should be taken to ensure that substrate walls are adequately watertight prior to application of the system. The system must only be installed where there are no signs of dampness on the inner surface of the substrate other than those caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of rain ingress.

10.3 The guidance given in BRE Report 262 : 2002 should be followed in connection with the watertightness of solid wall constructions. The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, workmanship and materials to be used.

10.4 At the top of walls, the system should be protected by a coping, adequate overhang or other detail designed for use with this type of system (see section 16).

## 11 Risk of condensation

11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of the construction, including openings and penetrations at junctions between the insulation system and windows, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

### Surface condensation



11.2 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $0.7 \text{ W} \cdot \text{m}^{-2} \cdot \text{K}^{-1}$  at any point and the junctions with other elements and openings comply with section 6.3.



11.3 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed  $1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$  at any point. Guidance may be obtained from BS 5250 : 2011 Section 4 and Annex G, and BRE Report BR 262 : 2002.

#### Interstitial condensation



11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2011 Section 4 and Annexes D and G.

11.5 The water vapour resistance ( $\mu$ ) factor (for the insulation boards) and equivalent air layer thickness ( $s_d$ ) (for the render systems) are shown in Table 7.



**Table 7 Water vapour resistance factor and equivalent air layer thickness**

	(s <sub>d</sub> ) (m)	(μ)
EPS 70 insulation thicknesses: 80 to 200 mm		20 to 40 <sup>(1)</sup>
Phenolic insulation thicknesses: 30 to 120 mm		50
Rendering system : weberend LAC (6 mm thick) + render system (specific particle size), as indicated below:		
weberend PTC + weberend dry dash	0.33	—
weberend PTC (8 mm thick) + weber PR310 + weberplast TF (particle size 1.5 mm)	0.80	—
weberend PTC (8 mm thick) + weber PR310 + webersil TF (particle size 1.5 mm)	0.78	—
weberend PTC (8 mm thick) + weber PR310 + webermineral TF (particle size 1.5 mm)	0.52	—
weber PR310 + weberplast TF (particle size 1.5 mm)	0.69	—
weber PR310 + webersil TF (particle size 1.5 mm)	0.67	—
weber PR310 + webermineral TF (particle size 1.5 mm)	0.41	—
Rendering system : weberend LAC Rapid (6 mm thick) + rendering system (specific particle size), as indicated below:		
weberend PTC + weberend dry dash	0.36	—
weberend PTC (8 mm thick) + weber PR310 + weberplast TF (particle size 1.5 mm)	0.83	—
weberend PTC (8 mm thick) + weber PR310 + webersil TF (particle size 1.5 mm)	0.81	—
weberend PTC (8 mm thick) + weber PR310 + webermineral TF (particle size 1.5 mm)	0.55	—
weberplast TF (particle size 1.5 mm)	0.47	—
webersil TF (particle size 1.5 mm)	0.46	—
webermineral TF (particle size 1.5 mm)	0.44	—
Rendering system : weberend LAC Rapid (3 mm thick) + rendering system, as indicated below:		
weberwall brick external adhesive (3 mm) + weberwall brick + weberwall brick pointing mortar	0.42	—

(1) It is recommended that the lower figure is used when assessing the interstitial condensation risk.

## 12 Maintenance and repair



12.1 An initial inspection should be made within 12 months and regularly thereafter to include:

- visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired
- examination of the sealant around openings and service entry points
- visual inspection of architectural details designed to shed water to confirm that they are performing properly
- visual inspection to ensure that water is not leaking from external downpipes or gutters; such leakage could penetrate the rendering
- necessary repairs effected immediately and the sealant joints at window and door frames replaced at regular intervals
- maintenance schedules, which should include the replacement and resealing of joints, for example between the insulation systems and window and door frame.

12.2 Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1 : 2016.

## 13 Durability



13.1 The system will remain effective for at least 30 years, provided any damage to the surface finish is repaired immediately and regular maintenance is undertaken, as described in section 12.

13.2 Any render containing cement may be subject to lime bloom. The occurrence of this may be reduced by avoiding application in adverse weather conditions. The effect is transient and less noticeable on lighter colours.

13.3 The finishes may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders,

discoloration by algae and lichens may occur in wet areas. The appearance may be restored by a suitable power wash or, if required, by over coating, provided the coating does not too adversely affect the water vapour transmission or fire characteristics of the system. The advice of the Certificate holder should be sought as to the suitability of a particular product.

## Installation

### 14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine suitability for treatment and the need for any necessary repairs to the building structure before application of the system. A specification is prepared for each elevation of the building indicating:

- the position of beads
- detailing around windows and doors and at eaves
- damp-proof course (dpc) level
- exact position of expansion joints, if required
- areas where flexible sealants must be used
- any alterations to external plumbing
- the position of fire barriers.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers to determine the bond strength between the adhesive and the substrate and be satisfied that the pull-out resistance of the proposed supplementary mechanical fixings from substrate is adequate. An assessment and recommendation should be made on the minimum bond strength and type and number of fixings required to withstand the building's expected wind loading based on calculations using the test site data in accordance with section 7.

14.3 All modifications, such as alterations to external plumbing and necessary repairs to the building structure, must be completed before installation of the system commences.

14.4 Surfaces should be sound, clean, and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight-edge tool spanning the storey height. Any excessive irregularities, ie greater than 10 mm in 1 m, must be made good prior to installation, to ensure that the insulation boards are installed with a smooth, in-plane finished surface.

14.5 Where surfaces are covered with an existing rendering, it is essential that the bond between the background and the render is adequate. All loose areas should be hacked off and reinstated.

14.6 On existing buildings, purpose-made sills must be fitted to extend beyond the finished face of the system. New buildings should incorporate suitably deep sills.

14.7 In new buildings, internal wet work (eg, screeding or plastering) should be completed and allowed to dry prior to the application of the system.

### 15 Approved installers

Application of the system, within the context of this Certificate, must be carried out by installers approved, recommended or recognised by the Certificate holder. Such an installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the system
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirement for each application team to include at least one member-operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections.

## 16 Procedure

16.1 Installation of the system should be carried out in accordance with the Certificate holder's current installation instructions and this Certificate.

16.2 Weather conditions should be monitored to ensure correct application and curing conditions. Application of coating materials must not be carried out at temperatures below 5°C or above 30°C, or if exposure to frost is likely, and the coating must be protected from rapid drying. Installation should not take place during rainfall or if rain is anticipated. In addition, cementitious-based renders must not be applied if the temperature will fall below 0°C within 24 hours of completion.

16.3 The planarity of the substrate must be checked, and any protrusions exceeding 10 mm removed.

16.4 Where required, a fungicidal wash is applied to the entire surface of the external wall by brush or spray and left for a minimum of 48 hours before removing dead growth with a stiff bristle or wire brush or alternatively by power washing.

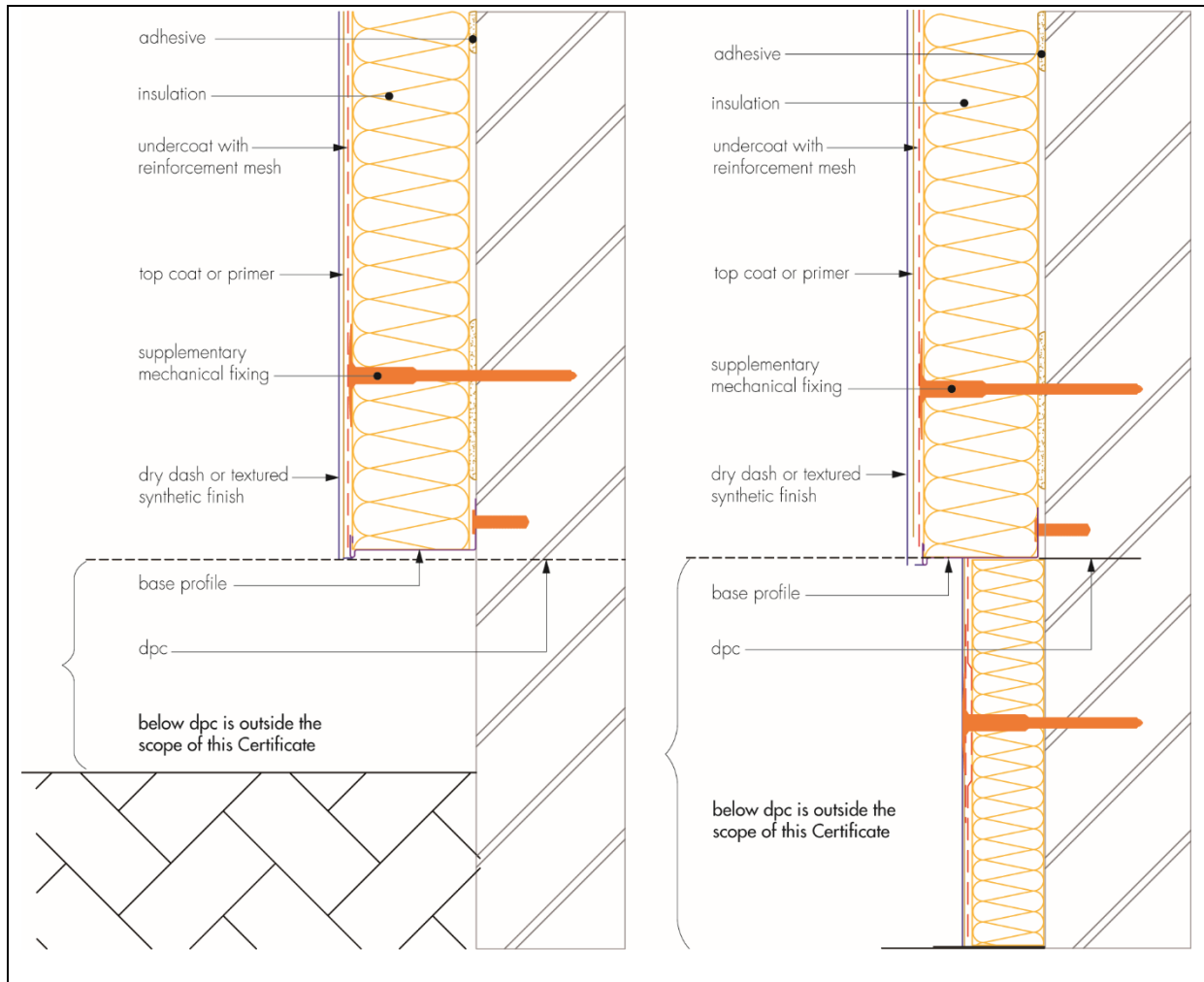
16.5 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2016.

16.6 Before installation takes place, the building designer must confirm where items such as rainwater goods, satellite dishes, clothes lines and hanging baskets will be placed. The fixing points for these items must be specifically designated and built into the system as the insulation is installed. This is outside the scope of this Certificate.

### **Positioning and securing insulation boards**

16.7 The base profile is secured to the external wall above the dpc using mechanical fixings at maximum 700 mm centres. Base profile connectors are installed at all profile joints. Extension profiles are fixed at the front lip of the base rail or stop end profile as appropriate. Profiles and expansion joints are fitted as specified (see Figure 3).

**Figure 3 Typical section of base profile**

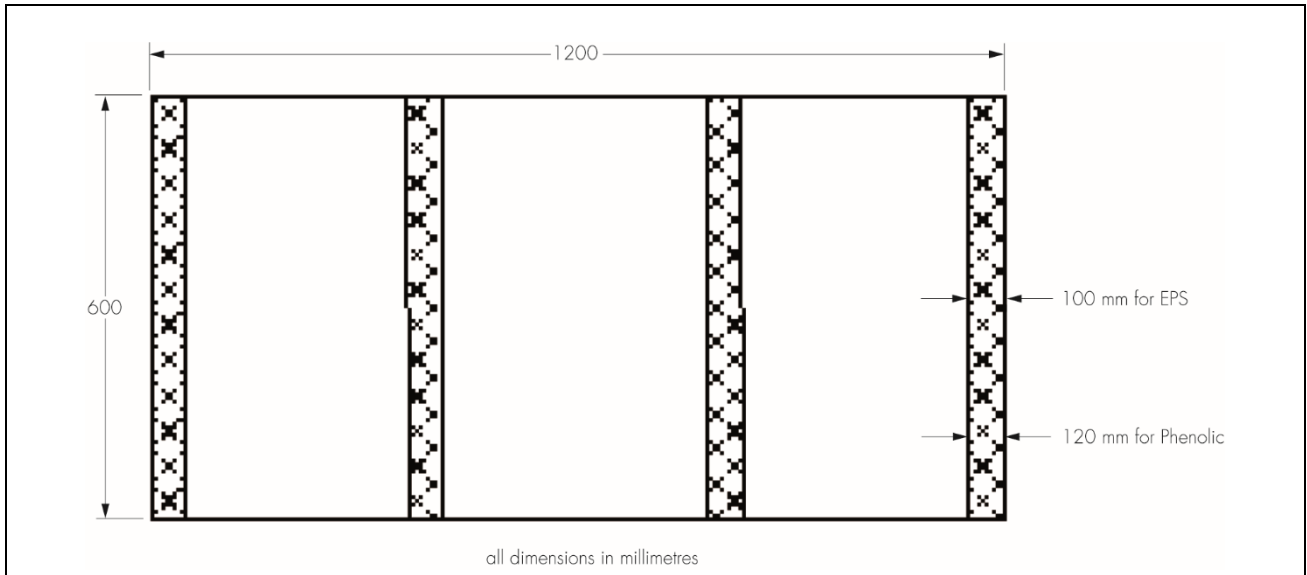


16.8 The insulation boards should be bonded to the wall using adhesive. The adhesive is prepared with the required amount of water (20 kg of weberend LAC to 5 litres of potable water), and mixed with a paddle mixer until the desired consistency is achieved. After allowing the adhesive to rest for 5 minutes, it is stirred again. The adhesive is applied to the insulation in four vertical strips, 100 mm wide for EPS and 120 mm wide for phenolic and 25 to 30 mm thick. The adhesive should cover a minimum 50% of the board for EPS and a minimum 60% of the board for phenolic and care must be taken to ensure that any incidental vertical cavities resulting from the staggered insulation board layout are closed at each row with the adhesive.

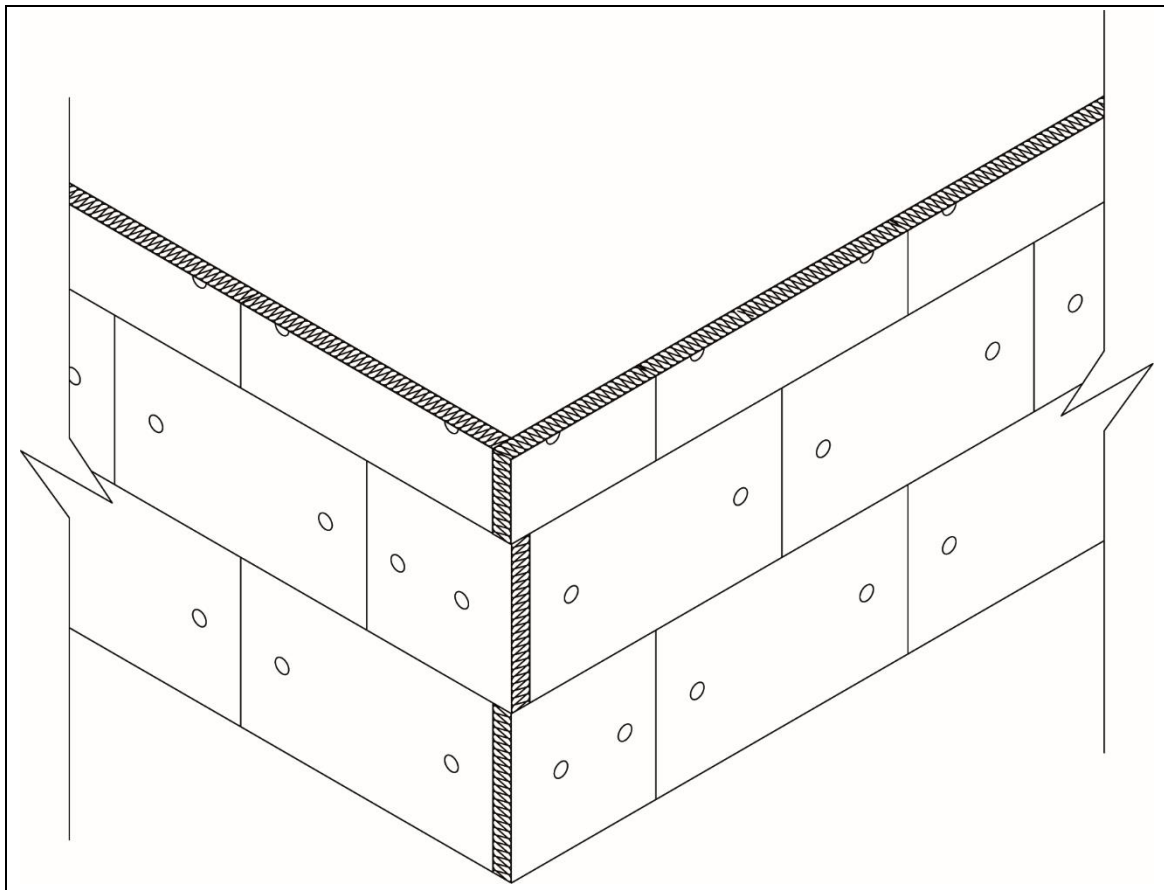
16.9 The first run of insulation boards is positioned on the base profile with adhesive applied and pressed firmly against the wall, butted tightly together and aligned to achieve a level finish.

16.10 Subsequent rows of boards are positioned so that the vertical board joints are staggered and overlapped at the building corners and so that the board joints do not occur within 250 mm of the corners of openings (see Figure 5) and any incidental vertical cavities are closed at each row with the adhesive. Joints between boards greater than 2 mm should be filled with slivers of insulation board or expansion foam with the appropriate reaction to fire classification. Gaps greater than 10 mm should be closed by repositioning or, where appropriate, by cutting boards to fit. Any high spots or irregularities are removed by lightly planing with a rasp. As phenolic insulation cannot be planed, adhesive is applied to the back of the boards to allow edges to be levelled during application. Alignment should be checked as work proceeds.

**Figure 4** *Insulation boards — adhesive pattern*



**Figure 5** *Typical arrangement of insulation boards*



16.11 To fit around details such as doors and windows, the boards may be cut with a sharp knife or a fine-tooth saw. If required, purpose-made window sills, designed to prevent water ingress and incorporate drips to shed water clear of the system, are fitted but their performance is outside the scope of this Certificate.

16.12 Before the adhesive has set, supplementary mechanical fixings are applied through the insulation boards into the substrate wall. The number of fixings is increased as required (such as in corner zones of the building), depending on the location of the building, wind load calculations and the installation height and as determined by the system designer. The fixings will also assist in securing the insulation board while the adhesive sets. Details of supplementary mechanical fixings (including their layout on the insulation boards) are based on pull-out test results, substrate type and wind loading data.

16.13 Holes are drilled through the insulation into the substrate wall to the required depth and 7 fixings per square metre are inserted and tapped or screwed firmly into place.

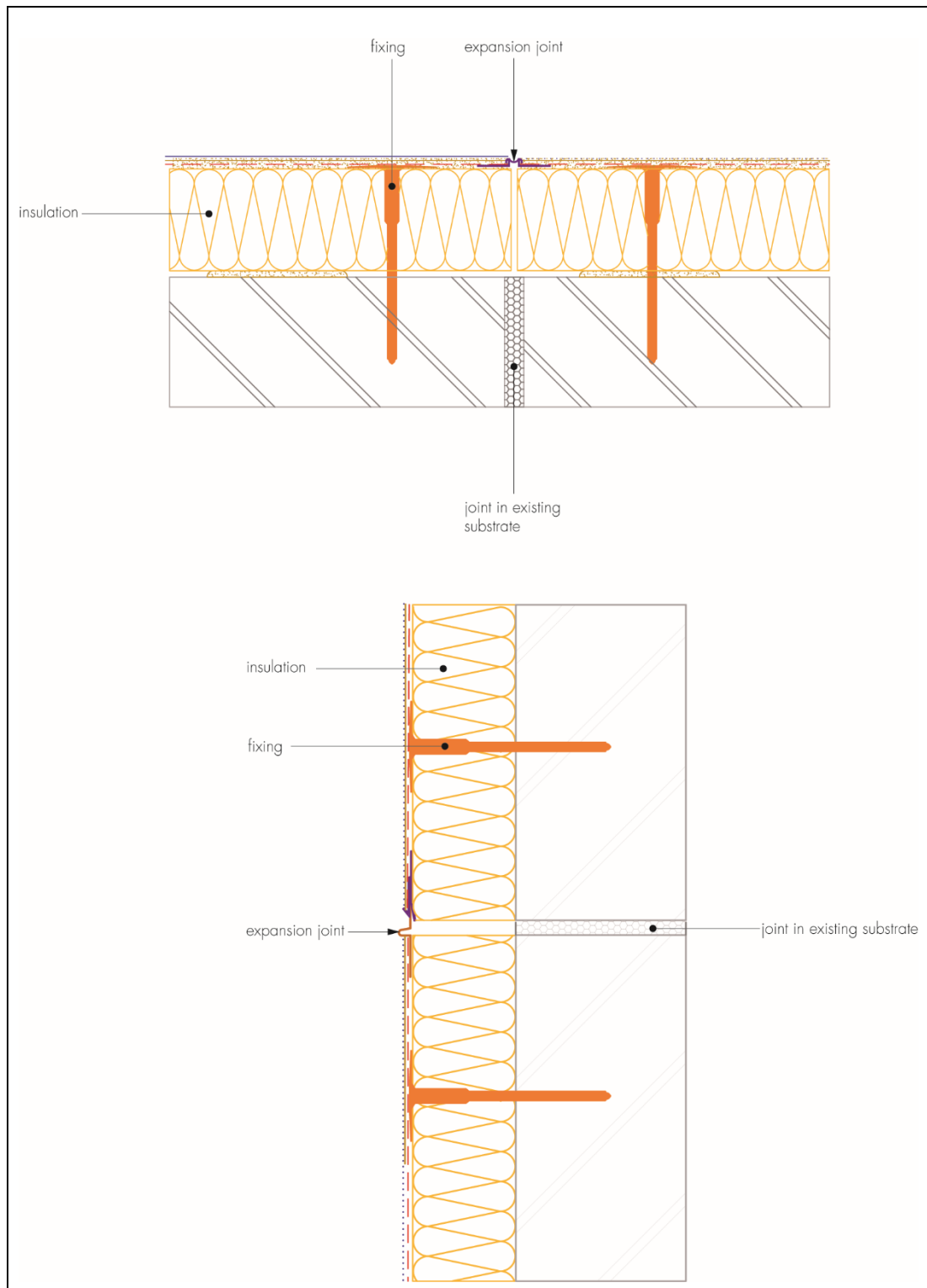
16.14 Installation continues until the whole wall is completely covered including, where appropriate, the building soffits. Building corners, door and window heads and jambs are formed using mesh angle profiles bonded to the insulation. Where appropriate, application-specific profiles are installed to allow rainwater to drain, in accordance with the manufacturer's instructions.

16.15 Periodic checks should be carried out as work proceeds. Allowance should be made where either existing render is on the wall or dubbing out render has been used to align the boards, as the effective embedment will be reduced. Window and door reveals should be insulated to minimise the effects of cold bridging.

#### **Movement joints**

16.16 Generally, movement joints in the substrate must be continued through the system by cutting through the insulation boards to coincide with the building's movement joint. The weber expansion joint profile is fully bedded in mortar on the insulation board surface (see Figure 6). For systems incorporating weberend PTC top coat, unbroken panels of render should be restricted to areas between 45 and 50 m<sup>2</sup>, with an aspect ratio no greater than 4:1. Systems incorporating only weberend LAC or weberend LAC rapid and a synthetic finish do not have area limitations.

**Figure 6** Example vertical and horizontal movement joints

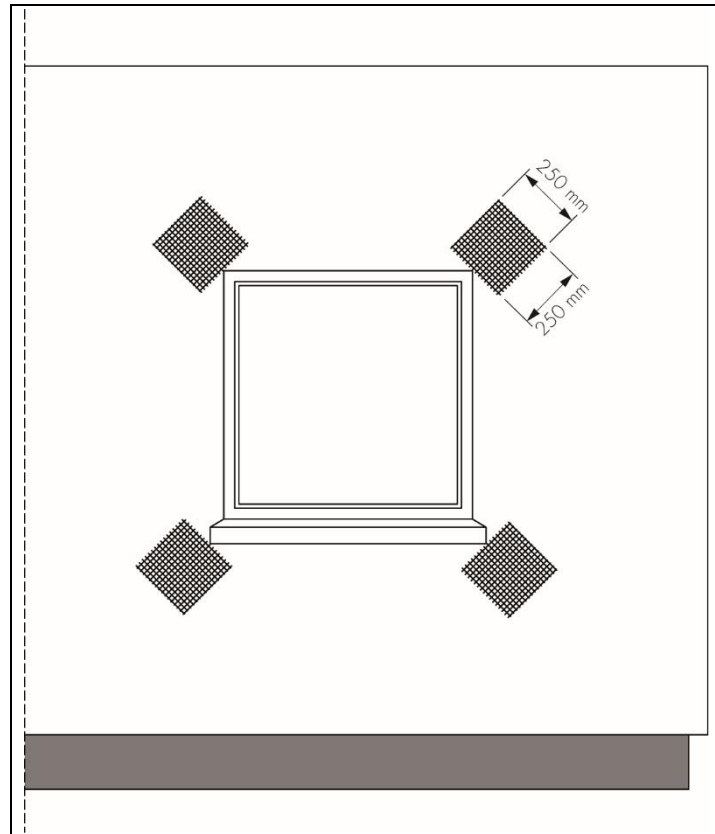


#### **Application of basecoat and reinforcing mesh**

16.17 To provide the necessary reinforcement, stress patches of reinforcing mesh (approximate size 250 by 250 mm) are applied with basecoat, diagonally over the insulation boards at the corners of openings so that they extend equally either side of the corner (see Figure 7). Angle beads and stop beads are positioned in accordance with the Certificate holder's installation instructions.



**Figure 7 Additional reinforcement of openings**



16.18 Application of basecoat must commence no earlier than 24 hours after the insulation boards have been adhesively fixed, and in any case after the adhesive has hardened. The basecoat is applied in two passes. The first layer of basecoat is applied progressively by trowel or spray machine to the surface of the dry insulation to achieve an approximate thickness of 3 mm.

16.19 Reinforcing mesh is applied and immediately embedded into the basecoat using the trowel, and overlapped at all mesh joints by not less than 100 mm. For systems other than the weberwall brick system, a further layer of basecoat is applied to give an overall minimum thickness of 6 mm, and the surface ruled level. For synthetic finish applications, the basecoat must be finished with a sponge float as the basecoat starts to 'take up', working in a figure-of-eight motion. Where a topcoat (weberend PTC) is to be applied, the surface of the basecoat should be comb scratched. The basecoat must be allowed to dry/cure (minimum 24 hours for weberend LAC Rapid basecoat and a minimum of 3 days for weberend LAC basecoat) before the application of the primer/finishing coat (weberend LAC rapid does not require a primer).

16.20 For the weberwall brick system a further 3 mm thick layer of weberwall brick external adhesive is applied over the wet first layer of basecoat to give an overall minimum thickness of 6 mm using a 10 mm square notched trowel to comb through the adhesive to prepare the wet adhesive for application of weberwall brick.

16.21 It is important to make sure that the reinforcing mesh is free of wrinkles and completely covered, and that the required minimum thickness of basecoat is achieved.

### **Rendering and finishing**

16.22 When applicable, the primer coat is applied by brush, roller or spray and allowed to dry prior to the application of the render finish (see Tables 1A and 1B).

16.23 Prior to applying the finishes, the relevant seals are positioned and installed at all openings (eg windows and doors), overhanging eaves, gas and electric meter boxes, wall vents or where the render abuts any other building material or surface. Unless a proprietary sealing bead has been installed prior to application of the basecoat render.

16.24 To prevent the finishes from drying too rapidly, they should not be applied in direct sunlight. The finished render surface should be protected from rain and frost until the material is dry and hard (approximately 24 hours in favourable conditions; in winter, this may take at least 48 hours). Continuous surfaces must be completed without a break.

### ***Render finishes***

#### **weberend PTC**

16.25 When the weberplast TF, webersil TF or webermineral TF finish is applied over the weberend PTC topcoat, the basecoat is comb scratched. The weberend PTC (topcoat) is prepared and mixed to a smooth, workable consistency then trowel-applied onto the basecoat to a thickness of approximately 6 to 8 mm. The top coat must be allowed to dry/cure (a minimum of 3 days) before the application of the primer/finishing coat.

#### **weberplast TF and webersil TF**

16.26 Where used, weberplast TF and webersil TF must each be mixed thoroughly before application. The chosen finish is applied with a steel trowel to a uniform thickness, and immediately worked with a thin plastic or wooden float to produce the desired texture.

#### **webermineral TF**

16.27 The webermineral TF is prepared and mixed to a smooth, workable consistency then trowel-applied onto the basecoat to a thickness of approximately 1.5 mm.

### ***Dry-dash aggregate finish***

16.28 Where a dry-dash finish is required, the basecoat is comb scratched. The weberend PTC (topcoat) is prepared and mixed to a smooth, workable consistency then trowel-applied onto the basecoat to a thickness of approximately 6 to 8 mm.

16.29 While the render is still soft, the dry-dash finish is applied with a dashing trowel. Narrow widths of weberend PTC are used around window and door openings and in reveals, and may be smooth-float-finished and painted. On completion, the surface should be checked to ensure an even coverage has been achieved.

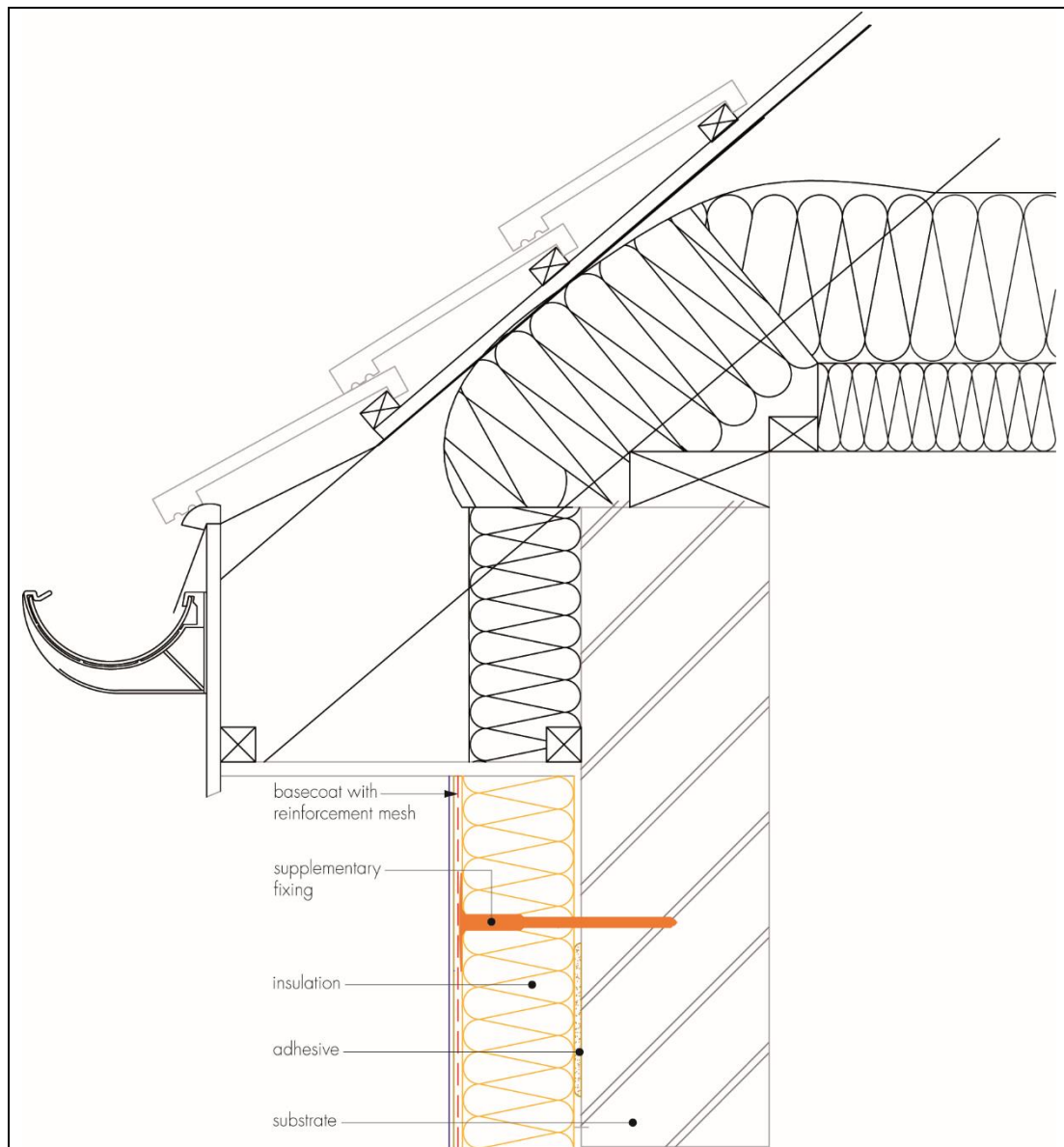
#### **weberwall brick slips with weberwall brick pointing mortar**

16.30 The weberwall brick is immediately pressed into the wet adhesive, ensuring the mesh is fully immersed in adhesive. Weberwall brick pointing mortar is then applied in joints once the adhesive has set in accordance with the Certificate holder's instructions. Excess mortar is removed with a dry brush.

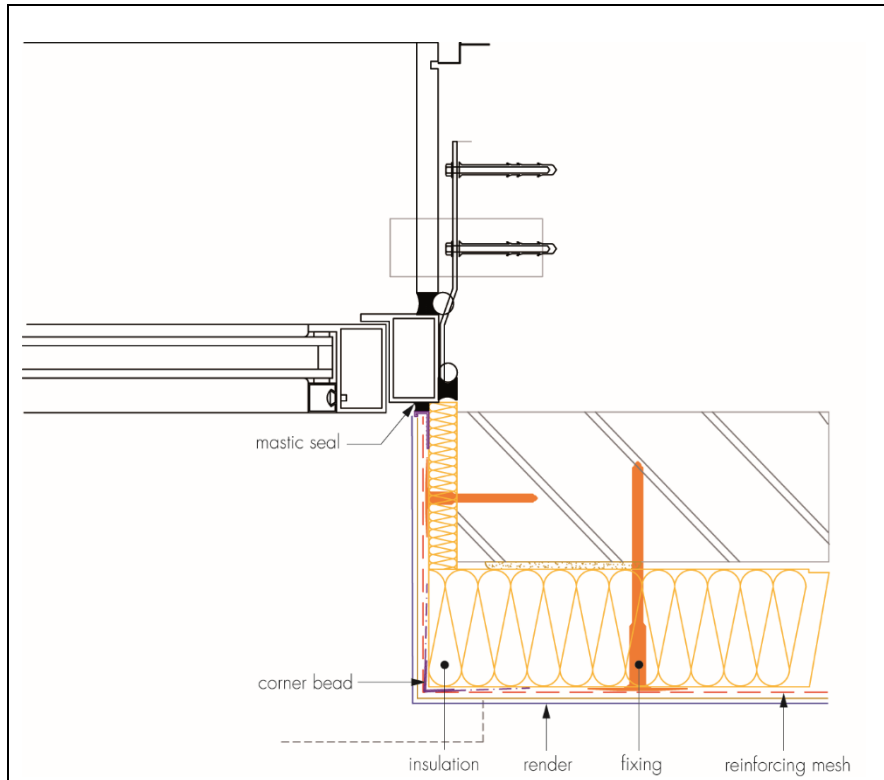
16.31 Care should be taken in the detailing of the system around features such as openings, projections and at eaves (see Figures 8 to 11) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

16.32 At the top of walls, the system must be protected by a coping, adequate overhang or adequately sealed, purpose-made flashing.

Figure 8 Roof eaves details



**Figure 9 External corner details**



**Figure 10 Insulated window detail**

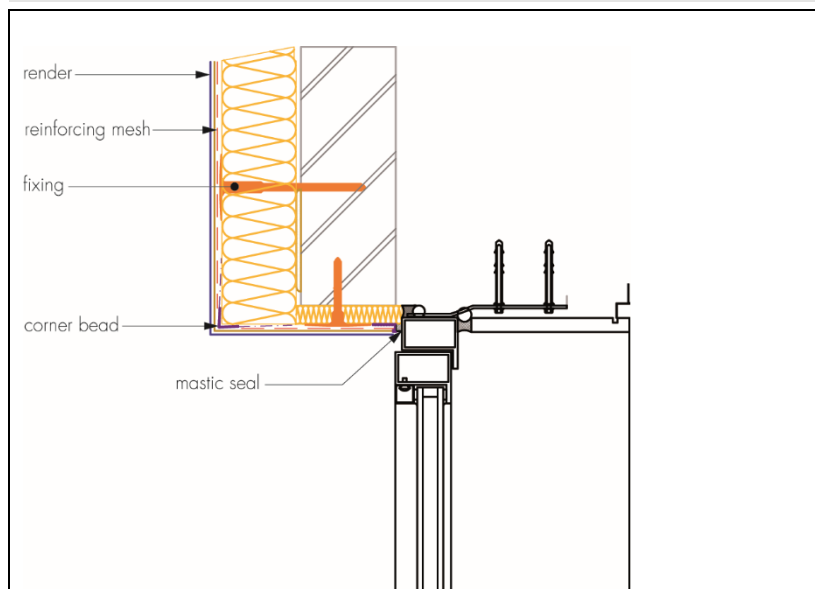
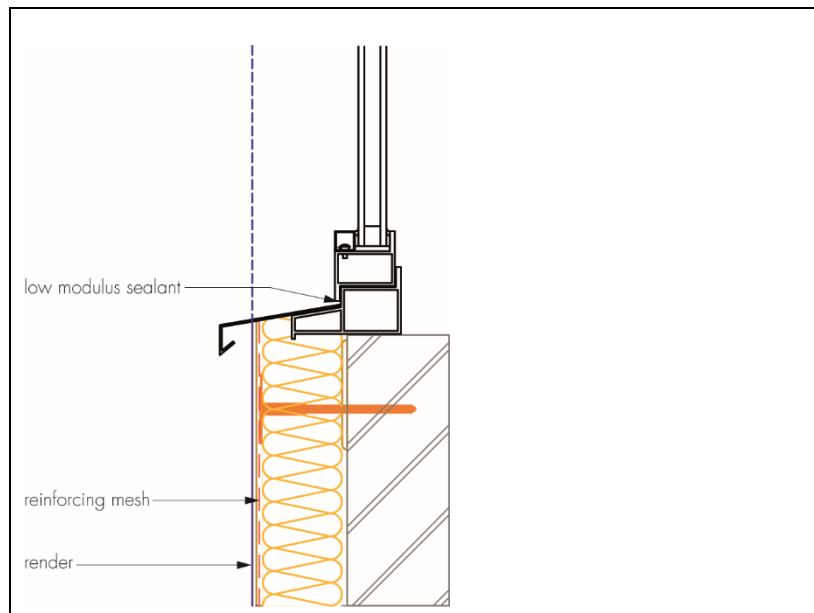


Figure 11 Window sill detail



## Technical Investigations

### 17 Tests

17.1 Results of tests were assessed to determine:

- reaction to fire classification in accordance with BS EN 13501-1 : 2018
- hygrothermal performance (heat/spray cycling)
- render/insulation bond strength
- resistance to hard body impact
- water vapour permeability
- water absorption.

17.2 An examination was made of data relating to:

- durability
- adequacy of the fixing system
- the risk of interstitial condensation
- thermal conductivity and example U values
- system wind load resistance.

### 18 Investigations

18.1 The practicability of installation and the effectiveness of detailing techniques were examined.

18.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

## Bibliography

- BRE Report BR 135 : 2013 *Fire performance of external thermal insulation for walls of multistorey buildings*
- BRE Report BR 262 : 2002 *Thermal insulation : avoiding risk*
- BRE Report BR 443 : 2006 *Conventions for U-value calculations*
- BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*
- BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*
- BS 8000-2.2 : 1990 *Workmanship on building sites — Code of practice for concrete work — Sitework with in situ and precast concrete*
- BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
- BS EN 1990 : 2002 + A1 : 2005 *Eurocode — Basis of structural design*
- BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*
- NA to BS EN 1991-1-4 : 2005 + A1 : 2010 *UK National Annex to Eurocode 1 — Actions on structures — General actions — Wind actions*
- BS EN 1992-1-1 : 2004 + A1 : 2014 *Eurocode 2 — Design of concrete structures — General rules and rules for buildings*
- NA + A2 : 14 to BS EN 1992-1-1 : 2004 + A1 : 2014 *UK National Annex to Eurocode 2 — Design of concrete structures — General rules and rules for buildings*
- BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
- NA to BS EN 1996-1-1 : 2005 + A1 : 2012 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
- BS EN 1996-2 : 2006 *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*
- NA to BS EN 1996-2 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*
- BS EN 13163 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made products of expanded polystyrene (EPS) — Specification*
- BS EN 13166 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made phenolic foam (PHS) products. — Specification*
- BS EN 13501-1 : 2018 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- BS EN 13914-1 : 2016 *Design, preparation and application of external rendering and internal plastering — External rendering*
- BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
- BS EN ISO 9001 : 2015 *Quality management systems — Requirements*
- BS EN ISO 11600 : 2003 + A1 : 2011 *Building construction — Jointing products — Classification and requirements for sealants*
- ETAG 004 : 2013 *Guideline for European Technical Approval of Plastic Anchors for fixing of External Thermal Composite Systems with Rendering*

### 19 Conditions

#### 19.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

19.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

19.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

19.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

19.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

19.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.